

# Emergency Action Plans for Dams in Texas

EAP Requirements and a How-To Guide  
For Tabletop Exercises

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2013 Dam Safety Workshop



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# Objectives

- Overview of an EAP
- TCEQ Rules and Guidelines
- Types of EAP Exercises
- How To: Put Together a Tabletop Exercise
- Example Tabletop Exercise
- Information for Dam Owners



# What is an EAP?

- A formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life
- Dynamic Document
- Requires Redundancy



# Who Needs an EAP?



## **Guidelines for Developing Emergency Action Plans for Dams in Texas**

Dam Safety Program  
Critical Infrastructure Division  
Texas Commission on Environmental Quality

GI-394  
Revised March 2012

- All high and significant hazard dams are required to have an EAP
- Significant hazard dams that are exempt are not required to have an EAP



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# Exemption Criteria

- Private Ownership
- Maximum Capacity Less than 500 acre-feet
- Located in a County With a Population Less Than 215,000
- Located Outside a City Limit
- Low or Significant Hazard



# Components of an EAP

- Cover and Title Page
  - Table of Contents
- Approval and Implementation Page
  - Notification Flowchart
    - Purpose
  - Project (Dam) Description
    - Responsibilities
  - Possible Emergency Conditions
    - Preventive Actions
  - Supplies and Resources
    - Inundation Map
    - Implementation



# Approval and Implementation Page

**APPROVAL AND IMPLEMENTATION  
EMERGENCY ACTION PLAN  
[NAME] DAM, [TX#####]**

This Emergency Action Plan is hereby approved. This plan is effective immediately and supersedes all previous editions.

\_\_\_\_\_  
[Name and Title of Appropriate Manager for Owner]

\_\_\_\_\_  
Date

I have received a copy of this Emergency Action Plan and concur with the notification procedures.

\_\_\_\_\_  
[Name and Title of Emergency management Coordinator]

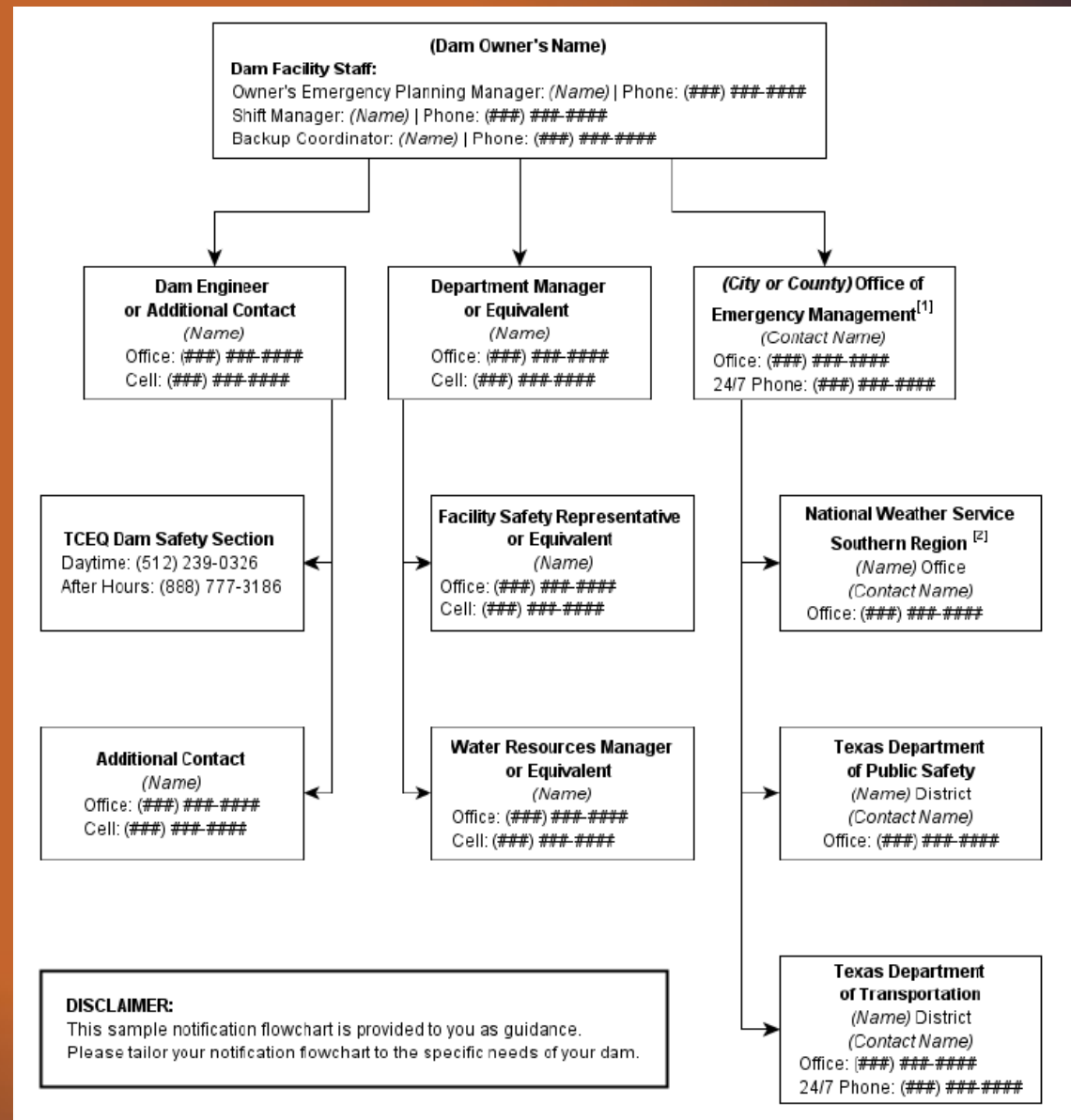
\_\_\_\_\_  
Date

- Wording may be changed, if necessary, to ensure that the EMC has seen the EAP



# Notification Flowchart

- Delegate who calls who and when
- Different flowcharts for different scenarios (watch condition, possible dam failure, imminent dam failure)





# Purpose

## Why Have EAP's?

- Identify emergency conditions threatening a dam
- Expedite effective responses to prevent a dam failure
- Reduce dam owner's potential liability
- Prevent property damage
- Save lives

The effort to prepare, test and update an EAP far outweighs the risk of not being prepared

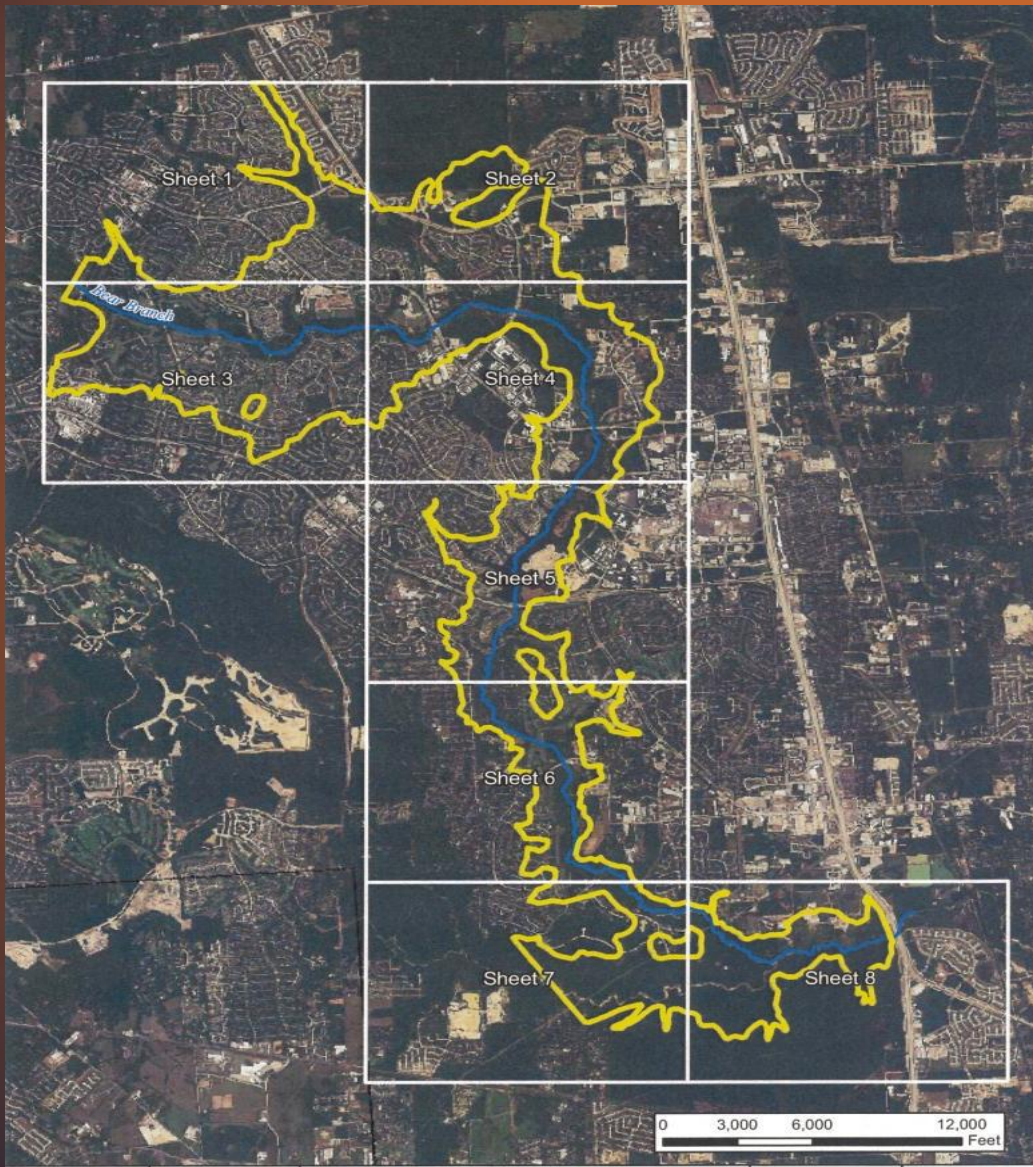


# Inundation Maps

- Depicts area that will flood if the dam fails
- Officials who will be evacuating downstream businesses and residents need to know who to evacuate and when
- Detailed or Generalized Inundation Maps



# Detailed Inundation Map



❖ Map prepared by P.E.



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# Generalized Inundation Map



TCEQ Dam Safety may assist with  
writing your EAP



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Your EAP Has Been Accepted...  
Now What?



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# What Do The Rules Say?

Title 30 Texas Administrative Code Chapter 299  
Dams and Reservoirs (§299.61)



# What Do The Guidelines Say?

## *Guidelines for Developing Emergency Action Plans for Dams in Texas (GI-394)*





# In a Nutshell...

- Review your EAP once a year. Submit to the TCEQ Dam Safety Program any updated pages or a letter stating there were no changes
  - Remember to check for up-to-date names and contact information for the flowcharts
  - Do not need to send in entire EAP again, only the updated sheets
  - Extent of review depends on size of the dam and complexity of downstream development
- Perform a Tabletop Exercise (at a minimum) every 5 years



# Annual Updates

- Check Notification Flowchart for up to date names and contact information
    - i.e. NWS contact map recently updated
    - Don't forget downstream residents
  - Check for anything else that needs to be updated
  - Worksheets provided in EAP Template in Guidelines
- ❖ Provide only the updated sheets, not required to resubmit whole EAP



## TAB 7

### ANNUAL EAP EVALUATION CHECKLIST

Was the annual dam inspection conducted?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, has the EAP been revised to include any signs of failures observed during the inspection?  <input type="checkbox"/> Yes <input type="checkbox"/> No
Was brush clearing, animal burrow removal, or other maintenance required?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, describe actions taken and date:
Was the outlet gate operable?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, describe actions taken and date:
Do the Notification Flowcharts require revision?  (Note that revision of the contact information will not require EAP approval; however, the revised contact information pages will need to be redistributed as a replacement pages.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, list the dates of the contact information revision and redistribution:
Was annual training or an exercise conducted?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Circle: <b>training</b> <b>exercise</b> Date conducted:
Are inspection and training records included in the EAP?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Was the EAP reviewed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, review date:
Were changes required to the EAP?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, date of revised EAP approval:

\_\_\_\_\_  
[Name and Title of Appropriate Manager for Owner]

\_\_\_\_\_  
Date

## **TAB 8**

### **PLAN REVIEW AND UPDATE**

This plan will be reviewed and updated annually and table top exercises will be conducted at least once every five years. Document these reviews below.

Date of review: \_\_\_\_\_

Participants: \_\_\_\_\_

Date of review: \_\_\_\_\_

Participants: \_\_\_\_\_

Date of review: \_\_\_\_\_

Participants: \_\_\_\_\_

Date of review: \_\_\_\_\_

Participants: \_\_\_\_\_

Date of table top exercise: \_\_\_\_\_

Participants: \_\_\_\_\_



# Exercises



# Why Are Exercises Important?

- Comply with State Rules and Guidelines
- Reduce Owner's Potential Liability
- Meet Key Players
- Confirm Names and Contact Information
- Establish Clear Lines of Communication
- Identify Unforeseeable Problems
- Reduces False Alarms
- Practice Makes Perfect



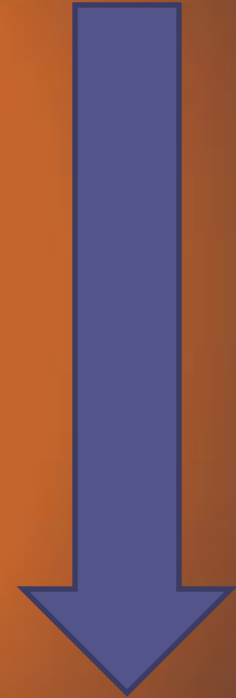
# Failing to Plan is Planning to Fail



# Types of Exercises

- Orientation Seminar/Workshop
- Drills
- Tabletop Exercises
- Functional Exercises
- Full-Scale Exercises

Less Involvement



More Involvement





# Orientation Seminar/Workshop

- Description:
  - A simple discussion of the EAP, familiarize internal key personnel with responsibilities and procedures
  - Talk about Who, What, When, Where, Why



# Orientation Seminar/Workshop

- Benefits:
  - Ideal for a small dam with few contacts on the Notification Flowchart
  - Good for refreshers in between Tabletop Exercises and training employees
- Drawbacks:
  - Not everyone is involved
  - Problems and issues with implementing the EAP would be difficult to detect



# Drills

- Description:
  - Tests one specific operation or function of an entity such as:
    - Validity of phone numbers in flowchart
    - Weekend response time
    - Remote equipment usage
    - Etc



# Drills

- Benefits:
  - Good for in-house testing
- Drawbacks:
  - Does not involve outside entities
  - Only focuses on one piece of the EAP



# Tabletop Exercises

- Description:
  - Hypothetical (but possible) scenario is provided (does not have to be a failure)
  - Actions and procedures are discussed
  - Focuses more on problem-solving than decision making



# Tabletop Exercises

- Benefits:
  - All responsible parties are together
    - People/Entities from flowchart
  - Informal meeting with low stress
  - EMC can determine best available evacuation routes without putting people in danger
  - Problems are found and fixed that day
  - Required by TCEQ



# Functional Exercises

- Description:
  - A scenario is run through with groups separated
  - Groups receive real-time updates under stress
  - Processes, equipment, etc are tested



# Functional Exercises

- Benefits:
  - Tests response time
  - Optimal benefits for high hazard dams and multiple responsible entities
- Drawbacks:
  - Time and personnel commitment





# Full-Scale Exercises

- Description:
  - Run through a scenario with all responsible jurisdictions, agencies, etc.
  - Personnel are deployed into action in the field
  - Changes may need to be made during the exercise to account for real-life/real-time observations
  - Evacuations may occur if previously notified



# Full-Scale Exercises

- Benefits:
  - Tests the full functionality of the EAP and finds weak spots
- Drawbacks:
  - Requires much coordination and notification of downstream residents (if evacuations are going to be tested)
  - Time and personnel commitment
  - Requires the use of all agency's vehicles, personnel, equipment, time, etc



# How To: Put Together a Tabletop Exercise



# 10 Steps to Put Together a Tabletop

Step 1: Where to Start

Step 2: Determine Who Should Attend

Step 3: Develop Mock Scenario

Step 4: Dry Run Scenario

Step 5: Contact Attendees

Step 6: Arrange for Meeting Space

Step 7: Develop Agenda

Step 8: Review Dam Data

Step 9: Review Inundation Maps

Step 10: Review EAP



# Step 1: Where to Start

- Decide who will facilitate/moderate the exercise
  - This can be the owner, a consultant, the EAP coordinator, local officials, etc
  - Will depend on the dam
- Decide what type of exercise will be performed



## Step 2: Determine Who Should Attend

- Depends on what type of exercise and location
- The more people from the notification flowchart and responsibilities section, the better
- If inundation area covers more than 1 county, invite officials from the other counties
- Do not invite downstream residents or businesses





# Step 3: Develop a Mock Scenario

- Make it dam specific and realistic
- If performing a drill or have a specific goal in mind, decide what critical aspect should be tested



# Step 4: Dry Run Exercise

- Go through the scenario and exercise to make sure there are no holes and everything makes sense





# Step 5: Contact Attendees

- Send out the announcement of exercise
- Hard copy letters or email is sufficient
- Notify TCEQ Dam Safety



# Step 6: Arrange For Adequate Meeting Space

- Since you already knows who's attending (Steps 1 and 4), find a space big enough for the group
- If performing Functional or Full-Scale Exercises, multiple spaces will be required in order to keep the groups separated



# Step 7: Develop the Agenda

- Finalize what will be discussed
- Create a schedule of topics for the day



# Example Agenda

- Introductions
- EAP and Dam Overview
- Inundation Map Overview
- Describe and Discuss Scenario
- Describe And Discuss Actions And Procedures, Especially As They Pertain To Specific Personnel
- Discuss Strengths, Weaknesses, Improvements, Etc With The EAP



# Step 8: Review the Dam's Pertinent Data

- Be sure to know the dam's measurements, spillway information, instruments, etc
- Make sure everyone knows where the dam is located
- If possible, travel to the dam to become more familiar



# Step 9: Review Inundation Maps

- Be familiar with downstream development
- Know what neighborhoods, cities, counties, etc will be affected



# Step 10: Review the EAP

- Be familiar with
  - Who has what responsibility
  - Where the command center will be
  - Information in the appendices (supplies and resources items and contact information, sample warning messages, conditions, etc)





# Example Tabletop Exercise



# Beaver Dam Tabletop Agenda

10am-10:15 Introductions

10:15am-10:45 EAP and Dam Overview

10:45am-11 Inundation Map Overview

11am-11:15 Describe and Discuss Scenario

11:15am-12:15pm Describe And Discuss Actions And Procedures, Especially As They Pertain To Specific Personnel

12:15pm-1:15 Break for Lunch

1:30pm-2:30pm Discuss Strengths, Weaknesses, Improvements, Etc With The EAP



# Introductions

- Go around the room and introduce everyone. This is a good way for people to interact with the people they will be in contact with in the event of a dam failure.
- Pass around the notification flowchart for everyone to verify their contact information



# EAP and Dam Overview

## BEAVER DAM

- Location= 9 miles southeast of Beaver Town
- Height= 15 feet
- Length= 1,500 feet
- Service Spillway= 3 foot diameter drop inlet
- Emergency Spillway= 200 foot wide earthcut channel





## Location Map for Beaver Dam

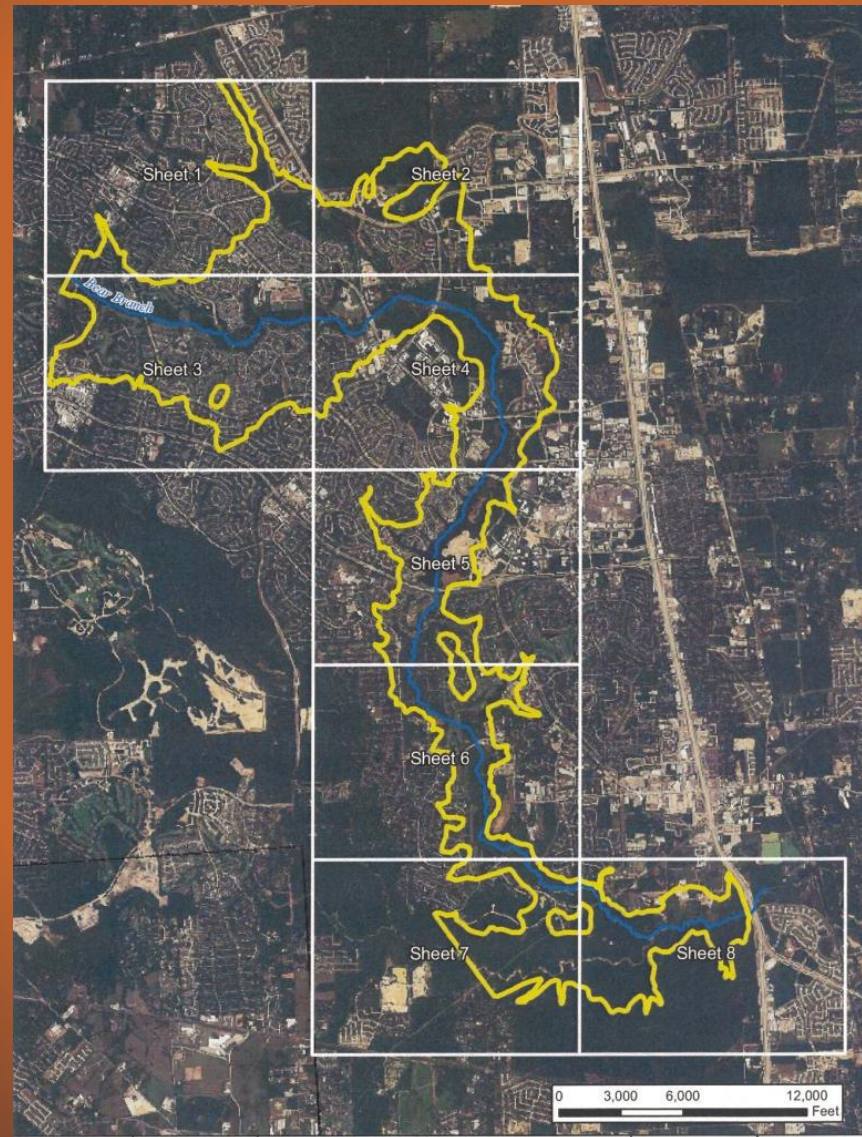
Beaver Town

Beaver  
Lake



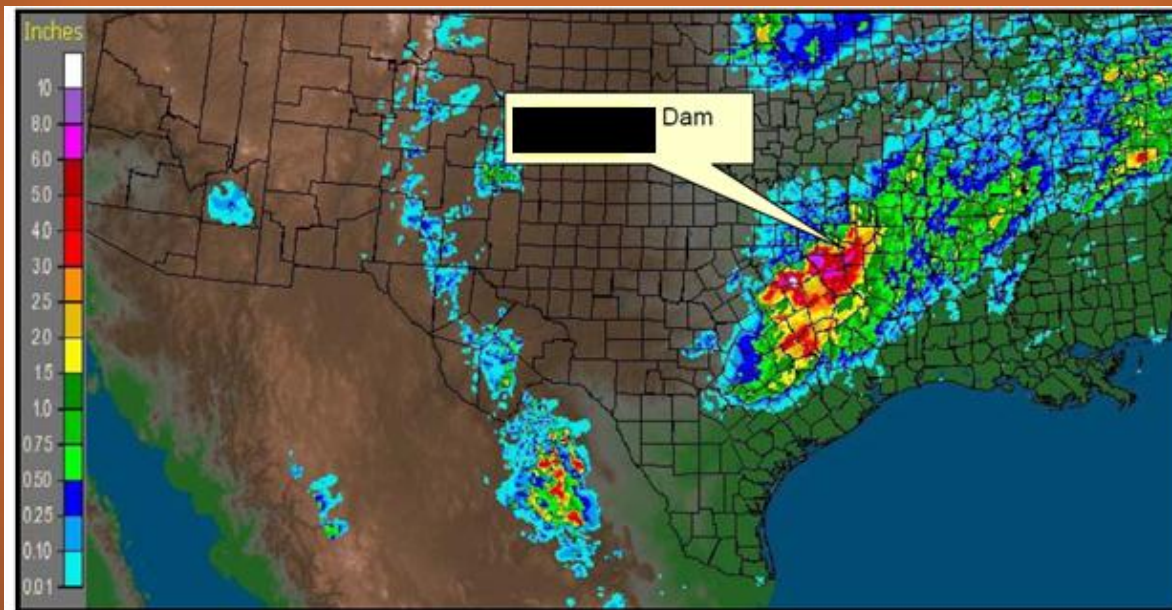


# Inundation Map Review



# Scenario

- Beaver Dam received 10 inches of rain overnight



**Figure 4:** Observed Daily Precipitation for [redacted] 2010 (Source: National Weather Service)





# Scenario

- At 9 am the next morning the owner notices water overtopping the dam by a couple of inches



# Actions and Procedures

- At this point, the Owner should implement the “Possible Dam Failure” condition notification flowchart, which includes:
  - Local emergency management coordinator (EMC) and sheriff
  - Owner’s engineer
  - TCEQ
  - National Weather Service



# Actions and Procedures

- Go around the room and ask people to describe what they would do and who they would call



# Strengths and Weaknesses with the EAP

- After the exercise, discuss:
  - What went well?
  - What went wrong?
  - Possibly break into 2 or 3 teams to talk about the issues from the day. Come together and discuss each group's findings.



# After the Tabletop Exercise

- Owner should go back and implement any changes discussed during the exercise.
- Any changes or modifications should be submitted to the distribution list in the EAP.
- Remember to schedule the next exercise in at least 5 years.



# For Dam Owners



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# Publications

- Documents are being provided by the federal government
- Instructs downstream residents to call their state dam safety office or emergency management coordinator for questions





# Dam Information TCEQ Can Provide the General Public

- Everything except hazard classification and EAP contents
  - i.e. Location, Size, Last Inspection Date, Condition of Dam, Etc
- Owner contact information
  - TCEQ will direct inquiries to the dam owner. It is recommended that the dam owner provide the information requested.



# References

- GI-394-1 Guidelines for Developing Emergency Action Plans For Dams In Texas
- TAC Chapter 299
- HSEEP Policy and Guidance  
(<https://hseep.dhs.gov/support/Volumel.pdf>)
- ASDSO EAP Basics Webinar presented by John W. France, PE (VP of URS)
- 'How to keep your EAP in shape with an Exercise Program' written and presented by Rita Anderson, PE (Freese and Nichols)
- 'South Prong Dam Tabletop Exercise' written and presented by Rita Anderson, PE (Freese and Nichols)



# Questions?

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